

pressure

# JOFRA™

## Pressure ranges

HPC600-2A	0 to 2 bara / 30 psia
HPC600-2C	Vacuum to 2 bar / 30 psi
HPC600-10A	0 to 10 bara / 150 psia
HPC600-10C	Vacuum to 10 bar / 150 psi

## High accuracy

±0.020% of reading +0.015% F.S.

## True field calibration

Fully temperature compensated

## Unique built-in electrical pump

HPC600 has a built-in automatic pressure system, based on an electrical pressure and vacuum pump.

## Complete 4-20 mA loop calibrator

HPC600 features a complete mA loop calibrator with all common loop calibrator features: measure, source & sink mA, and supply 24 volt for transmitters.

## Comprehensive set of features

Wide selection of useful functions and features. Damping, leak test, error calculation, min/max, switch test, etc.

## Thermometer

High accuracy thermometer, Pt100 sensor.

## External pressure modules

More than 60 different pressure modules, accuracy up to 0.01% F.S.

# Handheld Pressure Calibrator HPC600



The JOFRA HPC600 calibrator features a built-in electrical pump system for generation of pressure and vacuum by a touch of a single key!

Besides the unique pump system, the HPC600 offers a complete choice of features and functions making it an ideal tool and calibrator.

A true multifunction solution designed to save time, money and space... HPC600 is a pressure indicator, a pressure calibrator, a complete mA loop calibrator, including 24 volt supply, a voltmeter, a thermometer and a pressure/vacuum generator. All supplied in a ruggedized housing with an easy intuitive operating system in the palm of your hand.

The HPC600 is delivered as a ready-to-test system, complete with hose, fittings, and a padded soft case, equipped to meet any need for pressure calibration. An international traceable calibration certificate, including vacuum and electrical parameters is part of the standard delivery to make the HPC600 a truly ready-to-use solution.

The HPC600 can be used in a very wide range of applications from simple tool type jobs to complex calibration jobs in custody transfer systems. A time and money saver!

HPC600 is a multifunction tool designed to meet high accuracy pressure calibration applications. The HPC600 offers features such as a user configurable information display, 15 different pressure units, transmitter supply, mA input/output, % error calculation, voltage measurement, serial communication, and an external pressure module capability. The accuracy of the HPC600 calibrator is specified in % of reading to ensure an even better accuracy and more applicable pressure range. The HPC600 is temperature compensated from -10 to 50°C / 14 to 122°F for on-site operations. It is a truly superior pressure calibrator for laboratory and field use, bringing laboratory accuracy into the field.

The JOFRA APM series of pressure modules extends the application base of the HPC calibrators by allowing calibrations in additional ranges. The APM modules are compatible with several other JOFRA calibrators.

**Temperature measurement**

High accuracy temperature measurement port by use of the optional Pt100 sensor. A superb instrument for easy and convenient temperature measurement.

**Intuitive menu system**

Combination of "soft keys" and cursor keypad ensures an easy operation.

**ON / OFF**

Auto shut-off to expand battery life time (user programmable).

**Serial interface**

RS232 connection for JOFRA APM pressure module or computer.

**Pressure connections**

1/8" combined NPT/BSP female. 300 series stainless steel. 1/4" NPT male and 1/4" BSP female adapters are supplied as standard.

**Units**

15 different pressure engineering units.

**Clear graphical display**

Large backlit graphical display shows current status and mode, 1, 2 or 3 measurement windows, to suit your applications and demands.

**Full set of features**

Perform semi-automatic pressure switch test, leak test, % error calculation, switch in HART resistor or other calibration tasks through the outstanding functions and features of the HPC600.

**Electrical connections**

HPC calibrators are well equipped and include inputs for mA, voltage, including 24 VDC supply for mA transmitters, and source & sink for mA loop calibration and test.



## JOFRACAL CALIBRATION SOFTWARE

### Compatible with 2010 software release

JOFRACAL calibration software ensures easy calibration of RTD's, thermocouples, transmitters, thermoswitches, pressure gauges and pressure switches. JOFRACAL can be used with JOFRA DPC-500, HPC600, HPC500, HPC502 and IPI pressure calibrators, all JOFRA temperature calibrators, as well as JOFRA AMC910, ASC300 multi signal calibrator and ASM-800 signal multi scanner. When used with JOFRA ASM-800 signal multi scanner, JOFRACAL can perform a simultaneous semiautomatic calibration of up to 24 pressure and/or temperature devices under test in any combination.

JOFRACAL software controls the complete calibration procedure, stores the results and provides a calibration audit trail through hard-copy certificates. All calibration data are stored for each sensor to monitor drift and optimize recalibration intervals. A scheduler feature allows planning of future calibrations.

The JOFRACAL temperature calibration software may be downloaded free of charge from our website.

## REQUIREMENTS JOFRACAL

### Minimum hardware requirements:

- Intel® Pentium® II 1.4 GHz processor
- 64MB RAM (128MB recommended)
- 400MB free disk space on hard disk (500MB recommended) prior to installation
- Standard VGA (800x600, 256 colours). 1024x768 recommended
- CD-ROM drive or USB port for installation of program
- 1 or 2 free RS-232 serial ports, depending on configuration

### Minimum software requirements:

- Microsoft Windows® XP, Vista
- System fonts: MS Sans Serif and Arial

## JOFRA APM pressure module

The JOFRA APM external pressure modules extend the range of the JOFRA HPC. There are more than 60 models available with gauge, absolute, differential, and vacuum pressure references, in metric and imperial engineering units.

The modules are engineered for on-site or laboratory use. They are ready-to-use with the JOFRA HPC and the protocol allows for immediate recognition and use of the module once it is plugged into the calibrator.



**FUNCTIONAL SPECIFICATIONS****Pressure; gauge / compound ranges**

bar ..... -0.82 to 2 or 10  
 psi ..... -12 to 30 or 150

**Pressure; absolute ranges (available Q2, 2010)**

bara ..... 0.2 to 2 or 10  
 psia ..... 3 to 30 or 150

**Engineering units (built-in)**

User selectable ..... 15 units  
 (bar, mbar, MPa, kPa, inHg@0°C, mmHg@0°C, kg/cm<sup>2</sup>, mmH<sub>2</sub>O@4°C,  
 mmH<sub>2</sub>O@20°C, psi, inH<sub>2</sub>O@4°C, inH<sub>2</sub>O@20°C, inH<sub>2</sub>O@60°F, cmH<sub>2</sub>O@4°C,  
 cmH<sub>2</sub>O@20°C)

**Pressure accuracy reference temp. (18 to 28°C / 65 to 82°F)**

All pressure ranges ..... ±0.020% RDG + 0.015% F.S.

Vacuum ..... ±0.025% F.S.

F.S. (full scale) is the numerical value of the positive pressure range.

Accuracy includes hysteresis, nonlinearity, repeatability, reference standard uncertainty and typically 1-year long-term stability, operated inside the rated temperature span and pressure range. Frequently zeroing (gauge/compound) or entering of reference pressure (absolute) is required.

**Pressure accuracy ambient temp. (-10 to 50°C / 14 to 122°F)**

All pressure ranges ..... ±0.030% RDG + 0.015% F.S.

Vacuum ..... ±0.035% F.S.

F.S. (full scale) is the numerical value of the positive pressure range.

Temperature effect -10 to 0°C / 14 to 32°F ±0.005% F.S./°C.

Accuracy includes hysteresis, nonlinearity, repeatability, reference standard uncertainty and typically 1-year long-term stability, operated inside the rated temperature span and pressure range. Frequently zeroing (gauge/compound) or entering of reference pressure (absolute) is required.

**Display**

LCD ..... Graphical (with light)

Display resolution ..... 5 digits

Display update ..... 3 times per second

**RS232 communication interface**

Connector ..... LEMO

Serial ..... 0-5 VDC, 9600 baud, 8 data, no parity, 1 stop

Protocol ..... ASCII command language

**Input / output (18 to 28°C / 65 to 82°F)**

mA range, input, output and sink ..... 0 to 24 mA

mA accuracy, input ..... ±0.015% RDG + 2 µA

mA accuracy, output/sink ..... ±0.015% RDG + 2 µA

Transmitter supply ..... 24 VDC ±10%

Voltage measurement ..... 0 to 30 VDC

Voltage accuracy ..... ±0.015% RDG + 2mV

RTD range (ohms) ..... 84 to 140 Ω

RTC accuracy ..... ±0.015% RDG + 0.02 Ω

RTD range (temp.) ..... -40 to 155°C / -40 to 311°F

RTD accuracy @ 0°C/32°F (temp.) ..... ±0.10°C/0.18°F

HART® resistor ..... 250 Ω

Peak hold capture ..... 50 milliseconds

Switch test input ..... 5V (<1mA)

Temperature effect outside 18 to 28°C / 65 to 82°F ±0.001% F.S./°C.

**Media compatibility**

Dry, clean, non corrosive gasses

**Environmental**

Operating temperature ..... -10 to 50°C / 14 to 122°F

Storage temperature ..... -20 to 60°C / -4 to 140°F

Ingress protection rating ..... IP56

**Pressure connection**

All calibrators ..... 1/8" BSP/NPT female (combined)

Adapters to 1/4" NPT female and 1/4" BSP female are included as standard.

**Pressure overload**

Overload alarm ..... "OL" in display at approx. +20% F.S.

**Power supply**

Battery ..... 8 x 1.5 VDC Alkaline

Battery type ..... AA, LR6, MN1500, AM3

Battery lifetime .. More than 300 pump cycles to 10 bar/150 psi

Low battery indicator ..... Yes

**Instrument dimensions (LxWxH)**

Calibrator ..... 203x102x61 mm / 8x4x2.4 in

HPC600 weight (incl. battery) ..... 920 g / 32.5 oz

Calibrator, shipping ..... 560x350x180 mm / 22x13.8x7 in

Calibrator weight, shipping ..... 3,2 kg / 113 oz

**Miscellaneous**

Compliance: EN 61326 : 2006 & CISPR 11, Edition 5.0 - 2009 Class "B"

**ORDERING INFORMATION**

Order number	Description				
HPC	Type				
600	Model				
	Pressure range				
002A	0 to 2 bar / 30 psi absolute (available Q2, 2010)				
002C	Vacuum to 2 bar / 30 psi gauge/compound				
010A	0 to 10 bar / 150 psi absolute (available Q2, 2010)				
010C	Vacuum to 10 bar / 150 psi gauge/compound				
	Calibration certificate				
G	NIST traceable calibration certificate				
	Accessories (Optional)				
B	Rechargeable battery pack				
I	Interface kit LEMO to RS232				
T	Temperature sensor Pt100				
	Sample order number				
HPC	600	010C	G	BIT	HPC600, vacuum to 10 bar, NIST traceable certificate, rechargeable battery package, interface kit, temperature sensor



## HPC600 PRESSURE RANGES

This table shows the resolutions that can be obtained by the HPC calibrators throughout all engineering units.

HPC600 Ranges and Resolutions			
Range (bar/psi)	Factor	2.0 bar / 30 psi	10 bar / 150 psi
Burst pressure (bar/psi)		20 bar / 300 psi	20 bar / 300 psi
Proof pressure (bar/psi)		4 bar / 60 psi	14 bar / 200 psi
Engineering unit	Factor		
psi	1	30.000	150.00
bar	0.06894757	2.0684	10.3421
mbar	68.94757	2068.4	10342.1
kPa	6.894757	206.84	1034.21
MPa	.00689476	0.2068	1.03421
kg/cm <sup>2</sup>	0.07030697	2.1092	10.5460
cmH <sub>2</sub> O@4°C	70.3089	2109.3	10546.3
cmH <sub>2</sub> O@20°C	70.4336	2113.0	10565.0
mmH <sub>2</sub> O@4°C	703.089	21093	n/a
mmH <sub>2</sub> O@20°C	704.336	21130	n/a
inH <sub>2</sub> O@4°C	27.68067	830.42	4152.1
inH <sub>2</sub> O@20°C	27.72977	831.89	4159.5
inH <sub>2</sub> O@60°F	27.70759	831.23	4156.1
mmHg@0°C	51.71508	1551.5	7757.3
inHg@0°C	2.03602	61.081	305.40

Proof pressure - maximum allowable pressure without a shift in calibration

Burst pressure - sensor damaged or destroyed, some risk of personal injury

Absolute ranges - the data for the 2 bar / 30 psi and 10 bar / 50 psi ranges also applies to the absolute pressure versions of those ranges

## STANDARD DELIVERY (HPC Calibrator)

- HPC600 calibrator
- Padded soft carrying case
- Traceable calibration certificate (NIST) with pressure vacuum and electrical performance
- 8 x 1.5 volt batteries
- Adapter to 1/4" NPT female from 1/8" NPT male\*
- Adapter to 1/4" BSP female from 1/8" NPT male\*
- Quick connector set and 1 meter / 3 feet hose
- Test leads: red and black
- User manual



<b>Function / Feature</b>	<b>HPC600</b>
Single sensor high accuracy pressure calibrator	Yes
Automatic electrical pressure / vacuum pump system	Yes
mA measurement	Yes
mA output / source & sink	Yes
Voltage measurement	Yes
24 VDC transmitter supply	Yes
High speed pressure switch test	Yes
Temperature measurement with external RTD sensor	Yes
JOFRA APM pressure module connection	Yes
RS232 communication	Yes
On-line calculation of sensor error %	Yes
Automatic leak test timer function	Yes
High speed min./max. hold	Yes
Display contrast adjustment	Yes
Instrument setup lock	Yes
Storage of 5 setups	Yes
Setup of number of display windows / measurement channels	Yes
Setup of temperature sensor RTD type	Yes
Select display high or low resolution	Yes
Setup of backlight timer	Yes
HART resistor on/off	Yes
Normal or damped display update rate	Yes



## ACCESSORIES

### Rechargeable battery kit - Option B

The HPC600 is available with a set of 8 rechargeable AA batteries and a charger for 4 batteries.

### Interface kit - Option I

Special LEMO to Sub D, RS232 interface cable for HPC600.

### Temperature sensor - Option T

To utilize the thermometer utility of the HPC600, a ruggedized handheld temperature sensor is available. The sensor comes as a ready-to-use probe with handle and coiled cable with LEMO connector for HPC600. The sensor is built with a high accuracy Pt100 element, accuracy  $\pm 0.15^\circ\text{C}$  /  $\pm 0.27^\circ\text{F}$ . Sensor dimensions, without handle and cable, Ø4x200 mm/stainless steel.

### Complete calibration systems

The HPC600 is delivered as a ready-to-test system, complete and equipped to meet your pressure calibration needs.



#### AMETEK Calibration Instruments

is one of the world's leading manufacturers and developers of calibration instruments for temperature, pressure and process signals as well as for temperature sensors both from a commercial and a technological point of view.

#### JOFRA Temperature Instruments

Portable precision thermometers. Dry-block and liquid bath calibrators: 5 series, with more than 25 models and temperature ranges from  $-90^\circ$  to  $1205^\circ\text{C}$  /  $-130^\circ$  to  $2200^\circ\text{F}$ . All featuring speed, portability, accuracy and advanced documenting functions with JOFRACAL calibration software.

#### JOFRA Pressure Instruments

Convenient electronic systems ranging from -25 mbar to 1000 bar (0.4 to 15,000 psi) - multiple choices of pressure ranges, pumps and accuracies, fully temperature-compensated for problem-free and accurate field use.

#### JOFRA Signal Instruments

Process signal measurement and simulation for easy control loop calibration and measurement tasks - from handheld field instruments to laboratory reference level bench top instruments.

#### JOFRA / JF Marine Instruments

A complete range of calibration equipment for temperature, pressure and signal, approved for marine use.

#### FP Temperature Sensors

A complete range of temperature sensors for industrial and marine use.

#### M&G Pressure Testers

Pneumatic floating-ball or hydraulic piston dead weight testers with accuracies to 0.015% of reading.

#### M&G Pumps

Pressure generators from small pneumatic "bicycle" style pumps to hydraulic pumps generating up to 1,000 bar (15,000 psi).

*...because calibration is  
a matter of confidence*

**AMETEK®**  
CALIBRATION INSTRUMENTS

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